Causal Reasoning and Causal Abstraction

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ML Research Group
Department of Informatics

May 29, 2024

State of the art

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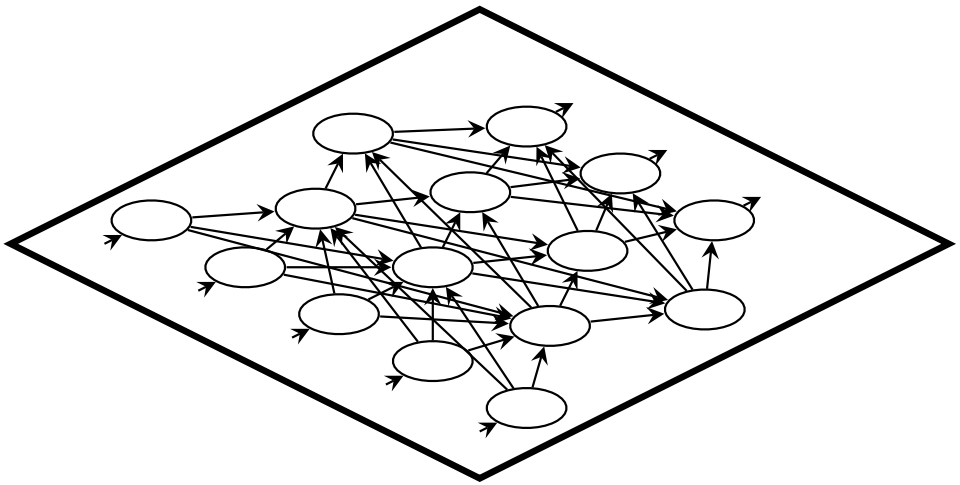

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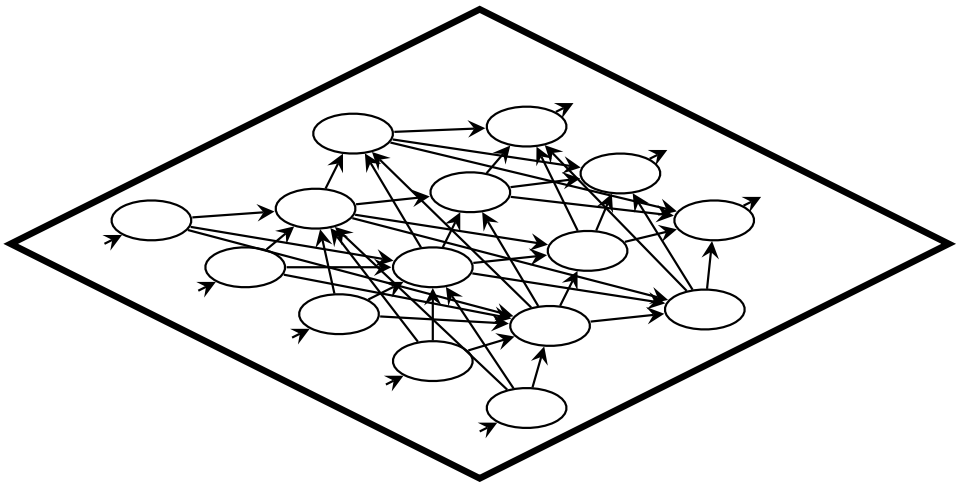
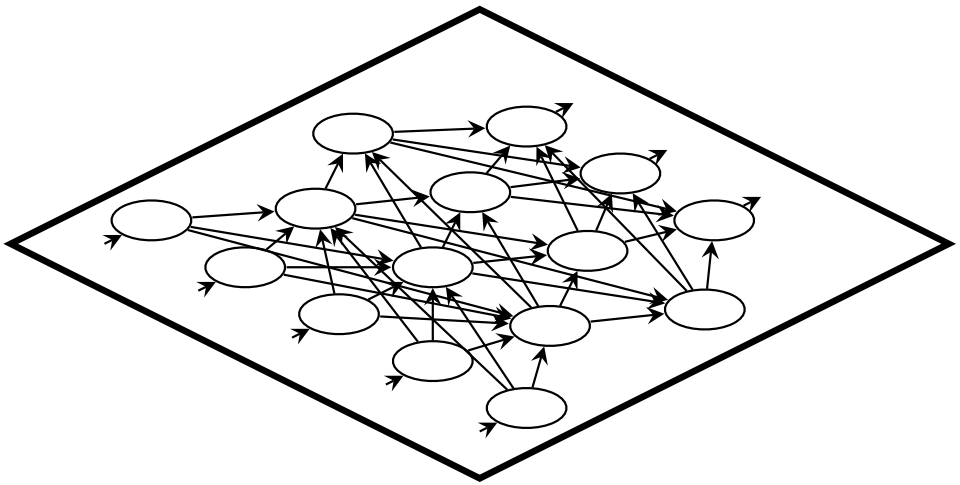


Lifetime
2yrs

State of the art



Lifetime
2yrs

Very good *static/correlational/predictive* results.

End-to-End Reasoning

This form of AI gives us

end-to-end reasoning/computing

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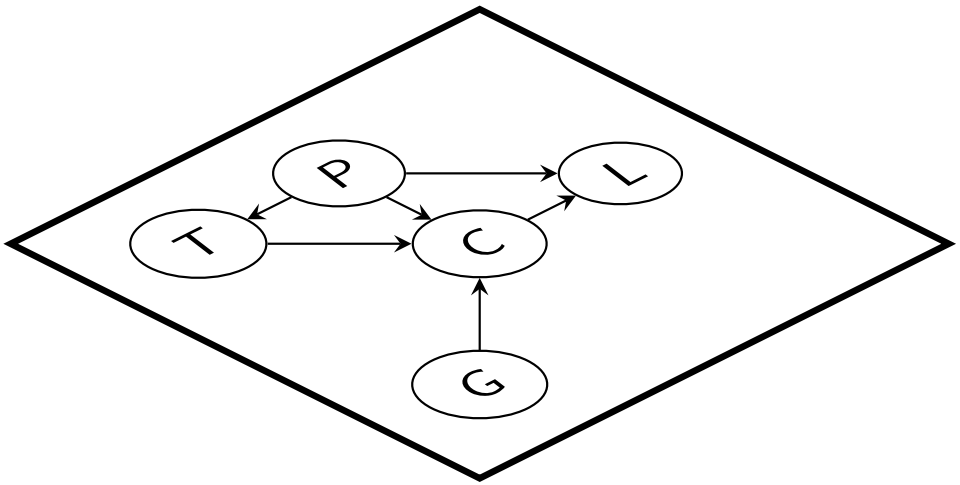
end-to-end reasoning/computing

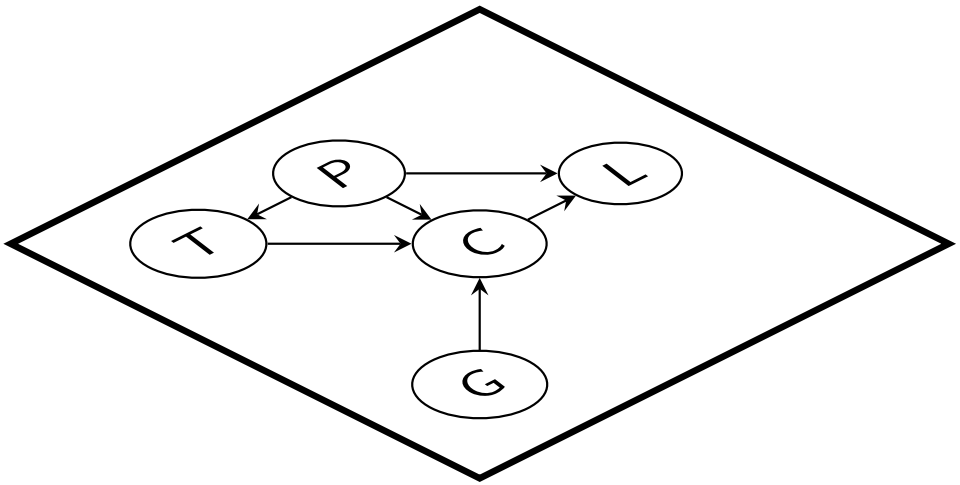
However, there are *other forms or aspects of reasoning/computing*

Causal Reasoning

Causal Reasoning



Causal Reasoning



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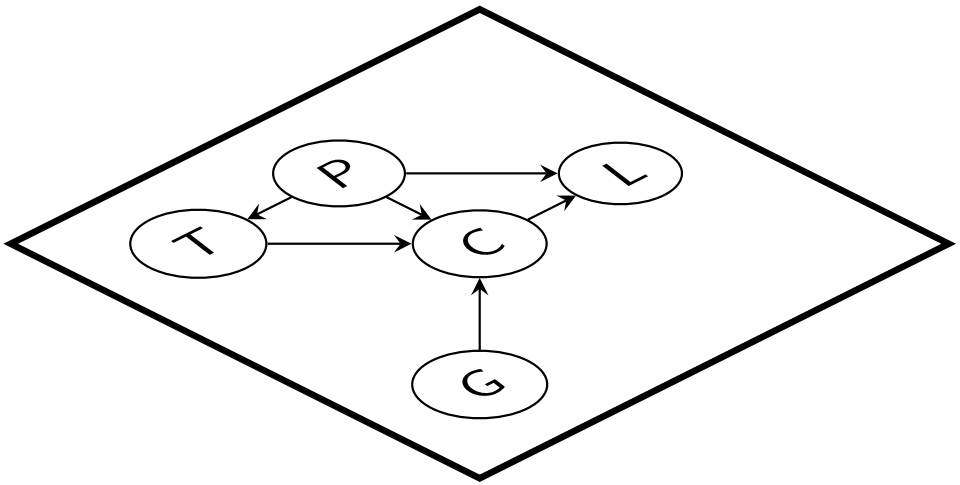
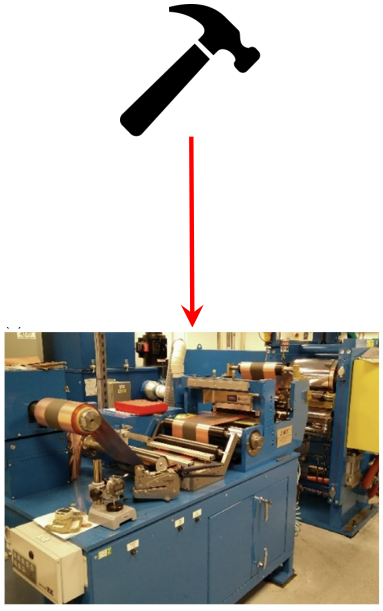


Lifetime
2yrs

We consider ***causal reasoning/computing***.

Causal Reasoning

Causal Reasoning



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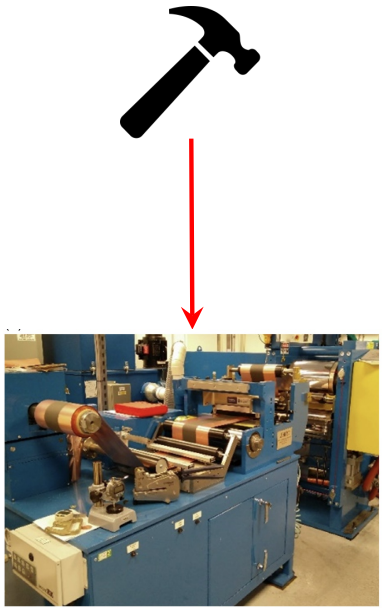

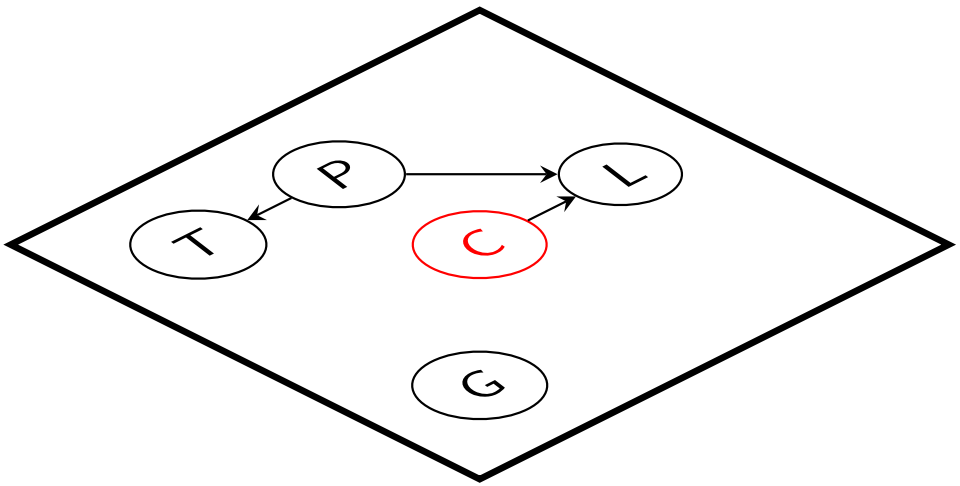

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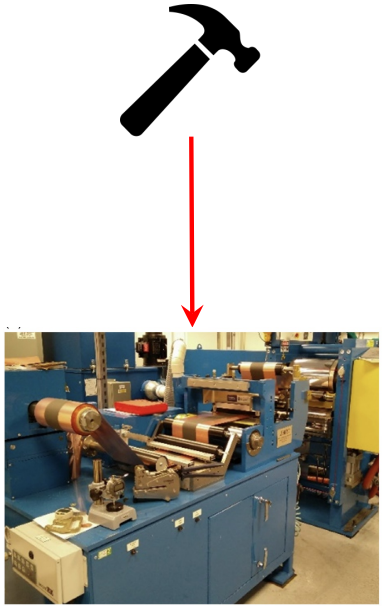
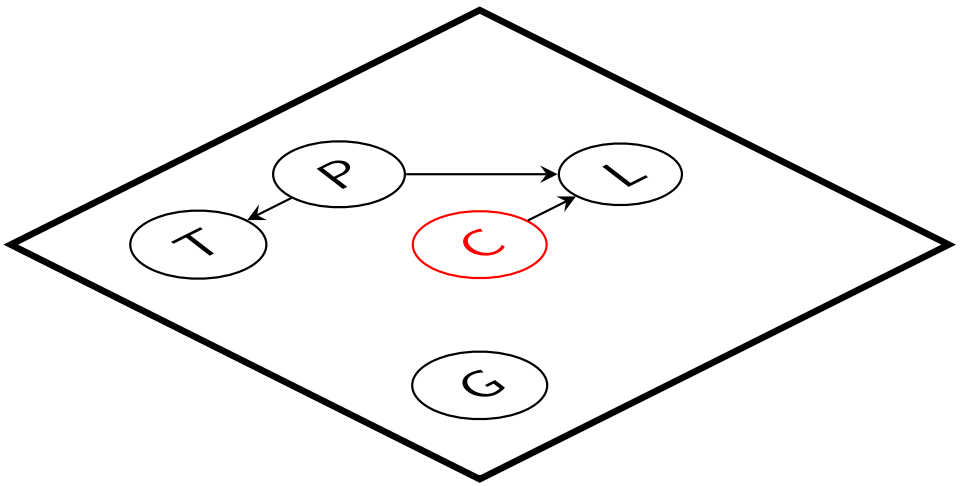
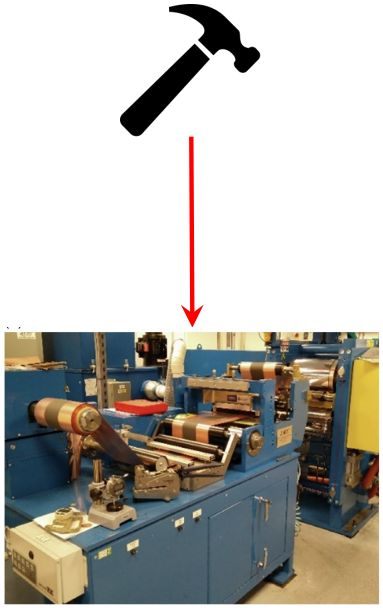
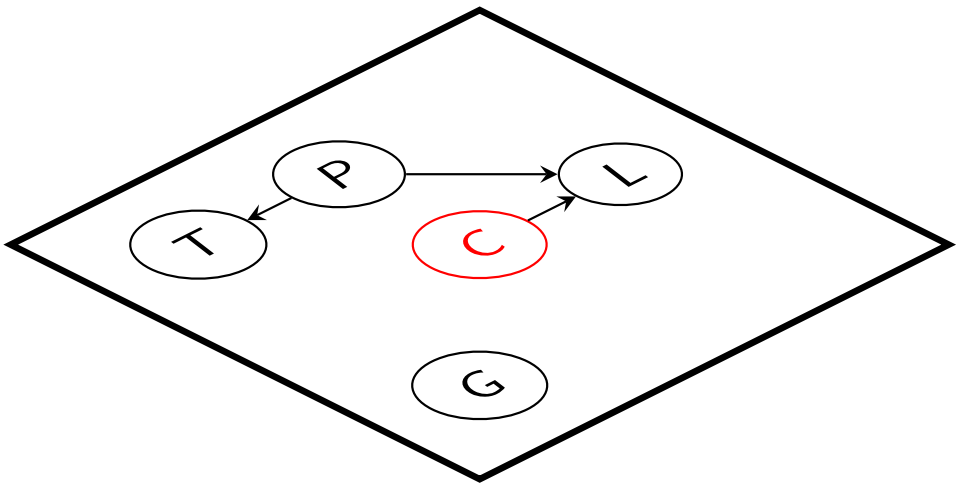




Lifetime
2.3yrs

Causal Reasoning





Lifetime
2.3yrs

Very good *hypothetical/interventional/control* results.

Multi-level Reasoning

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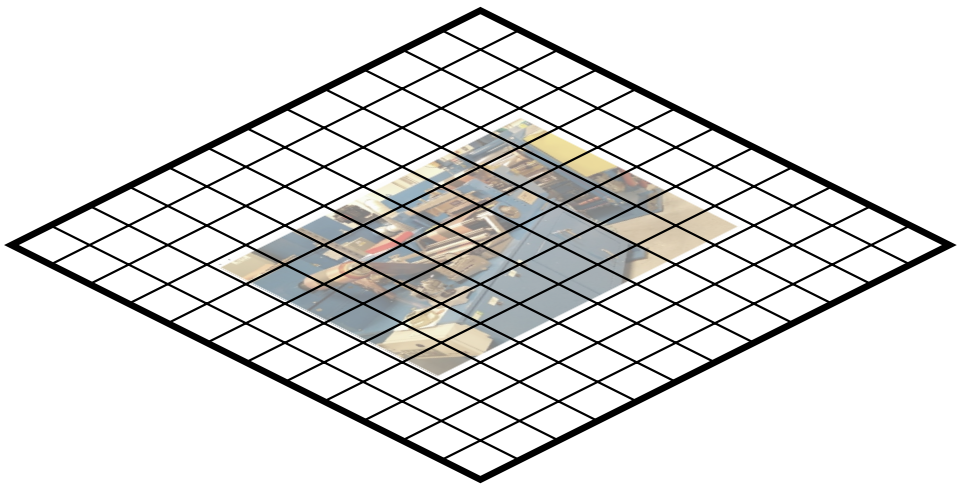

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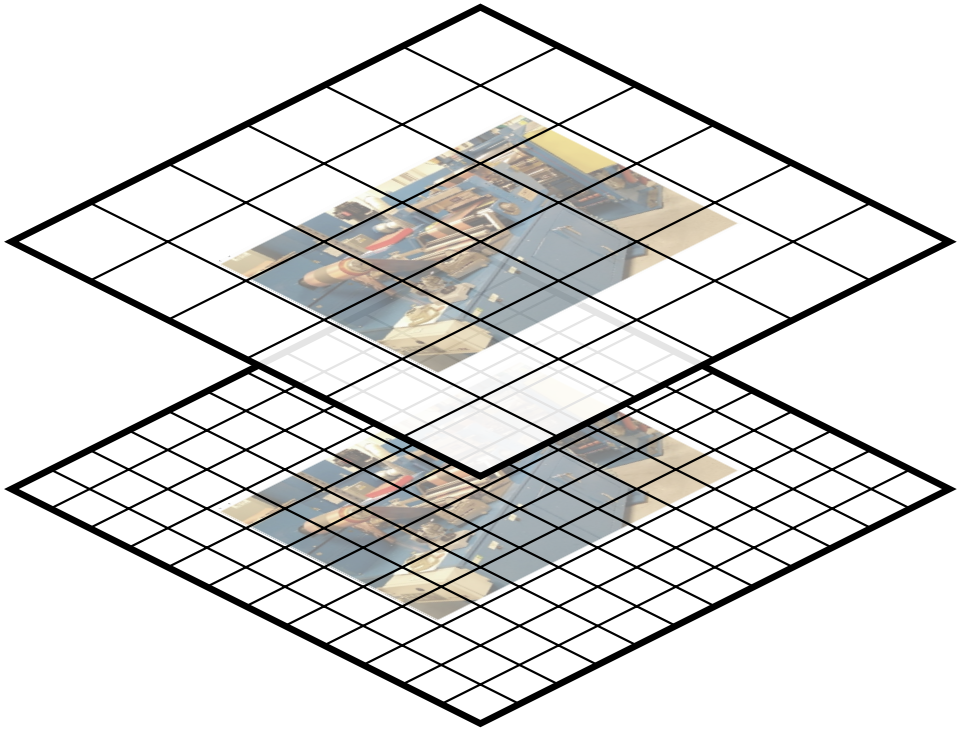

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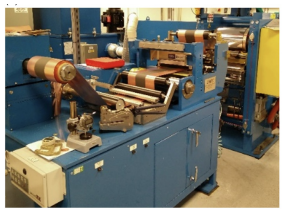

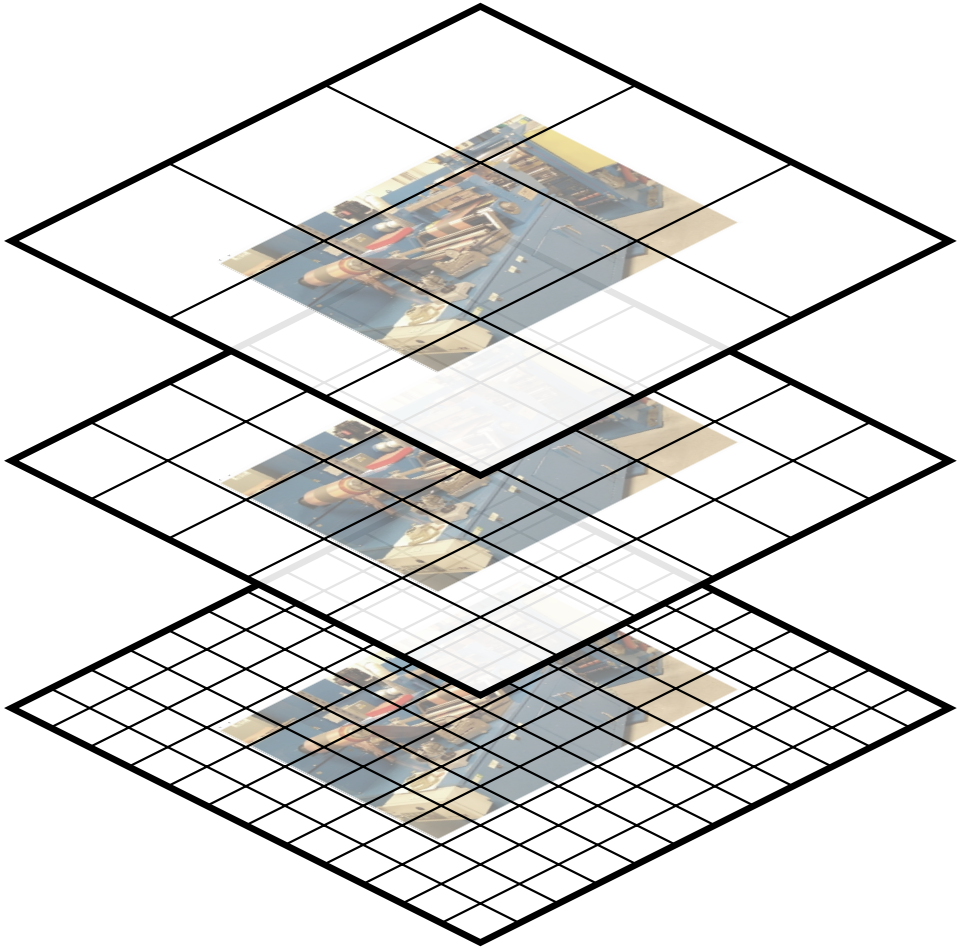

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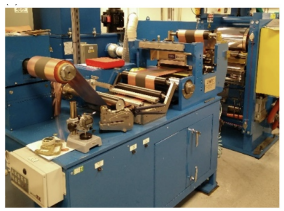

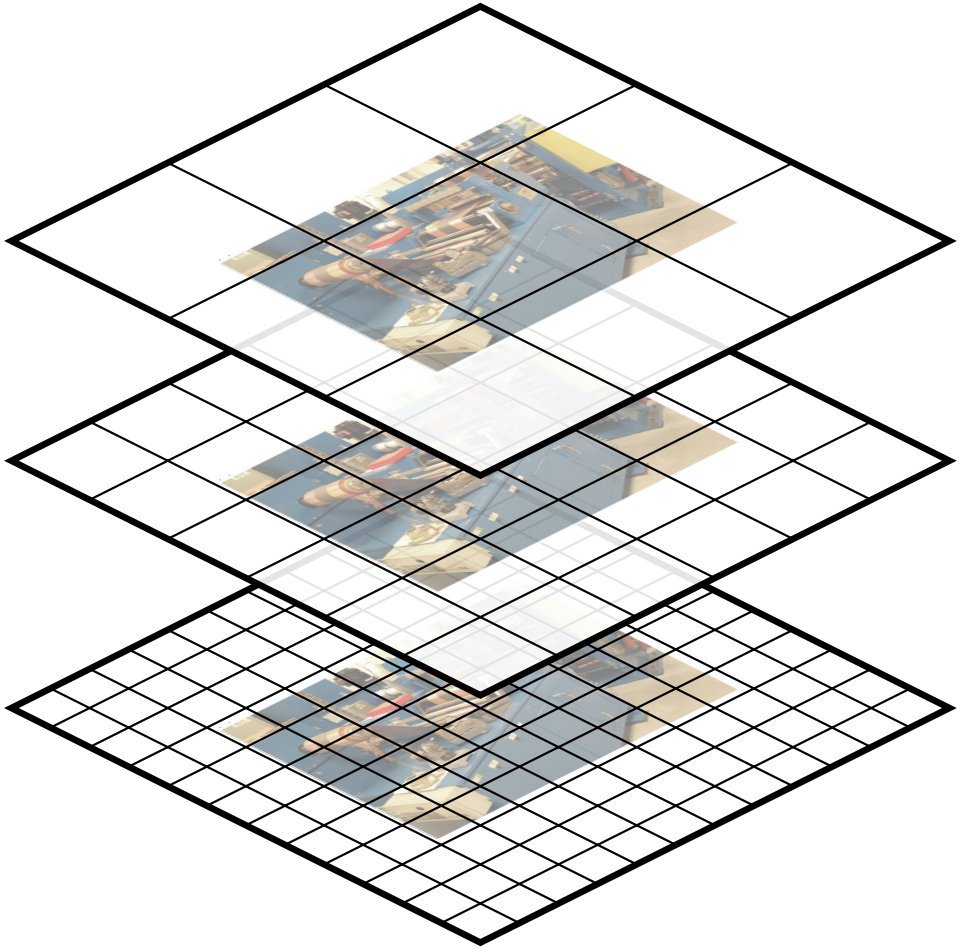

Lifetime 2yrs

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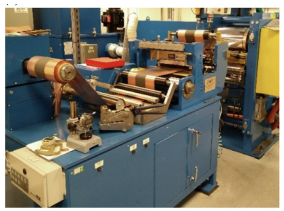

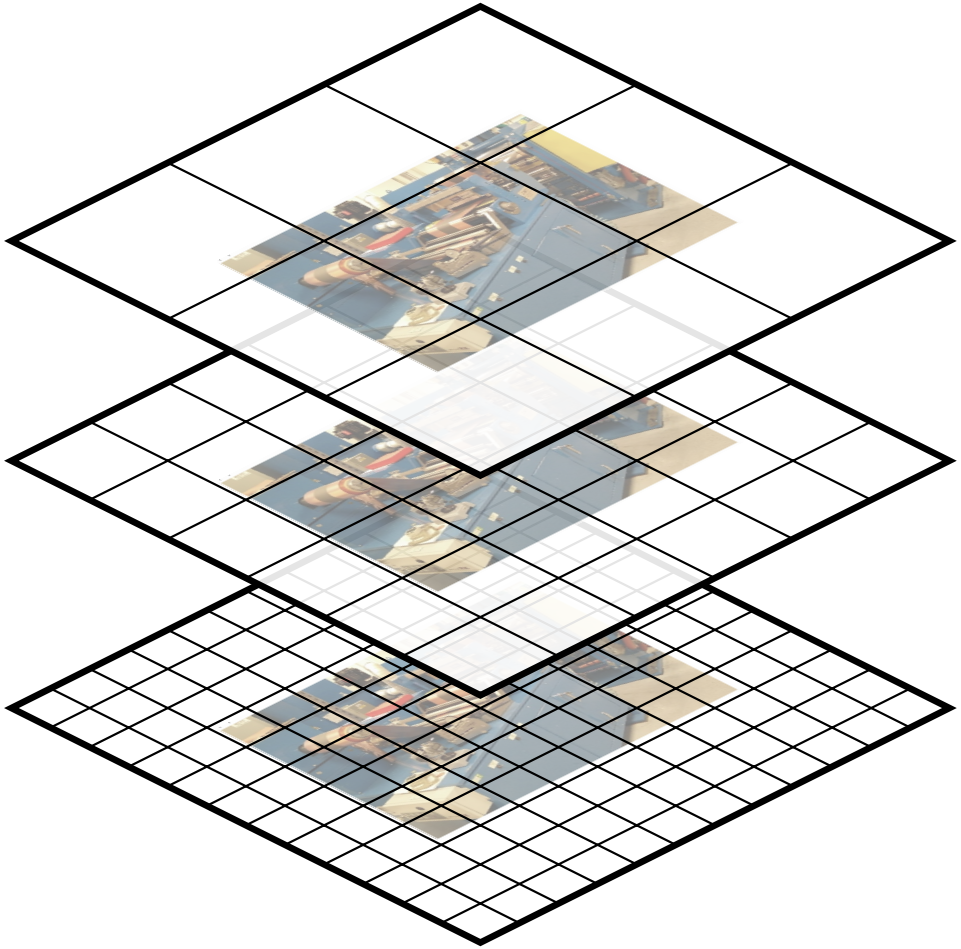

Lifetime 2yrs

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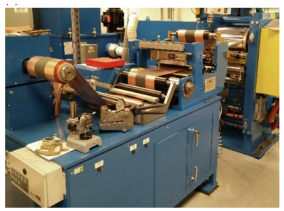

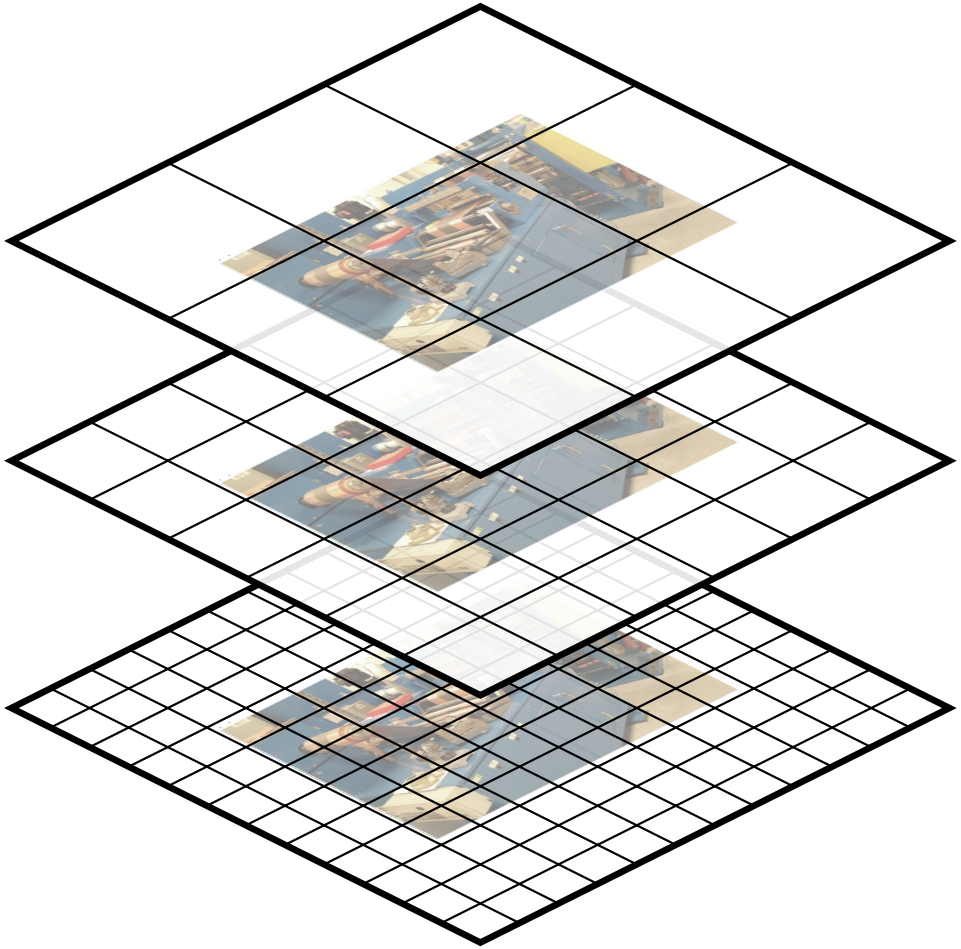

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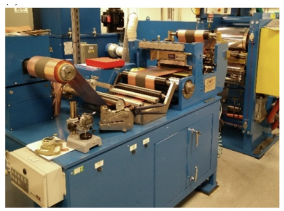
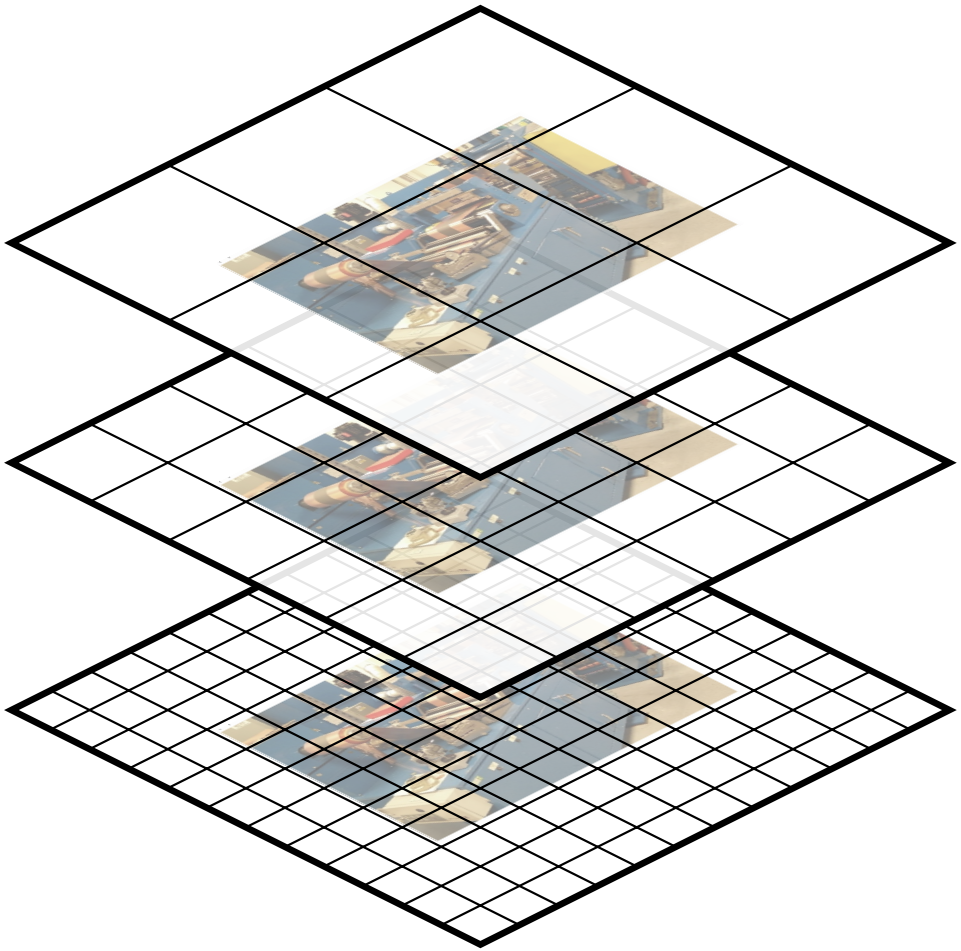




We consider ***multilevel reasoning/computing***.

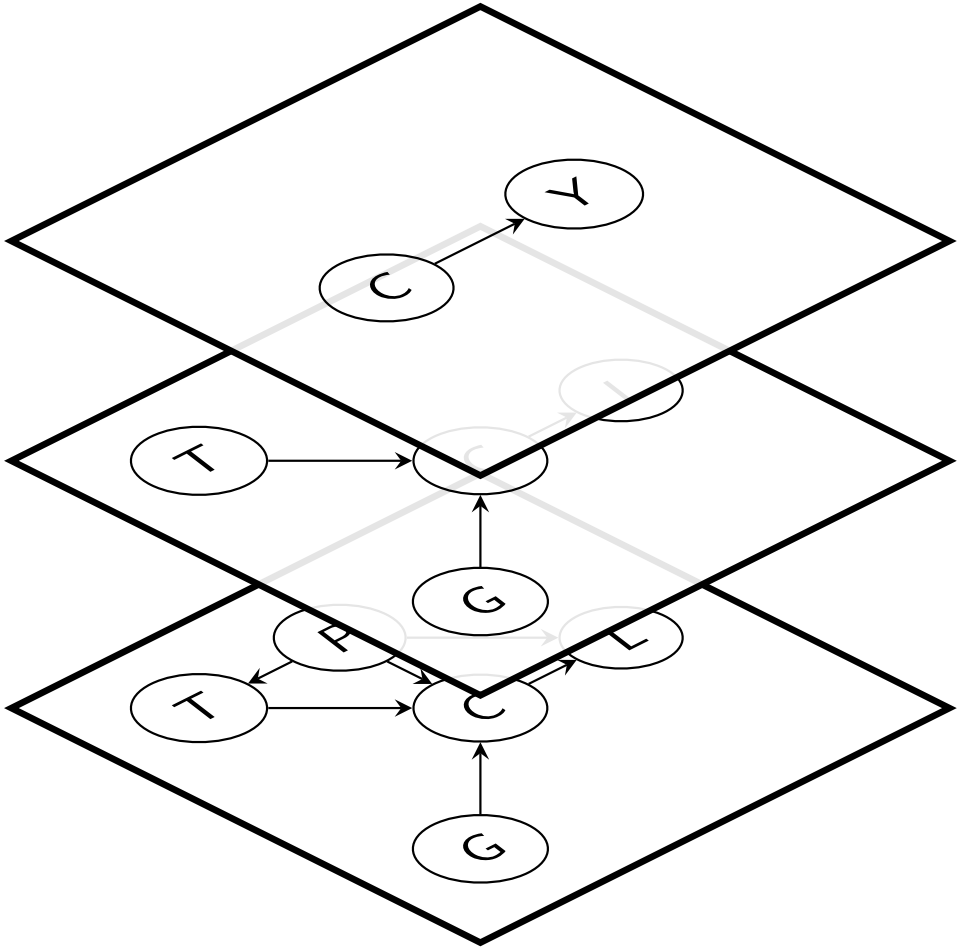
Causal Abstraction

Causal Abstraction Theory aims at combining:

- *Causal reasoning*
- *Multilevel reasoning*

Causal Abstraction

Causal Abstraction



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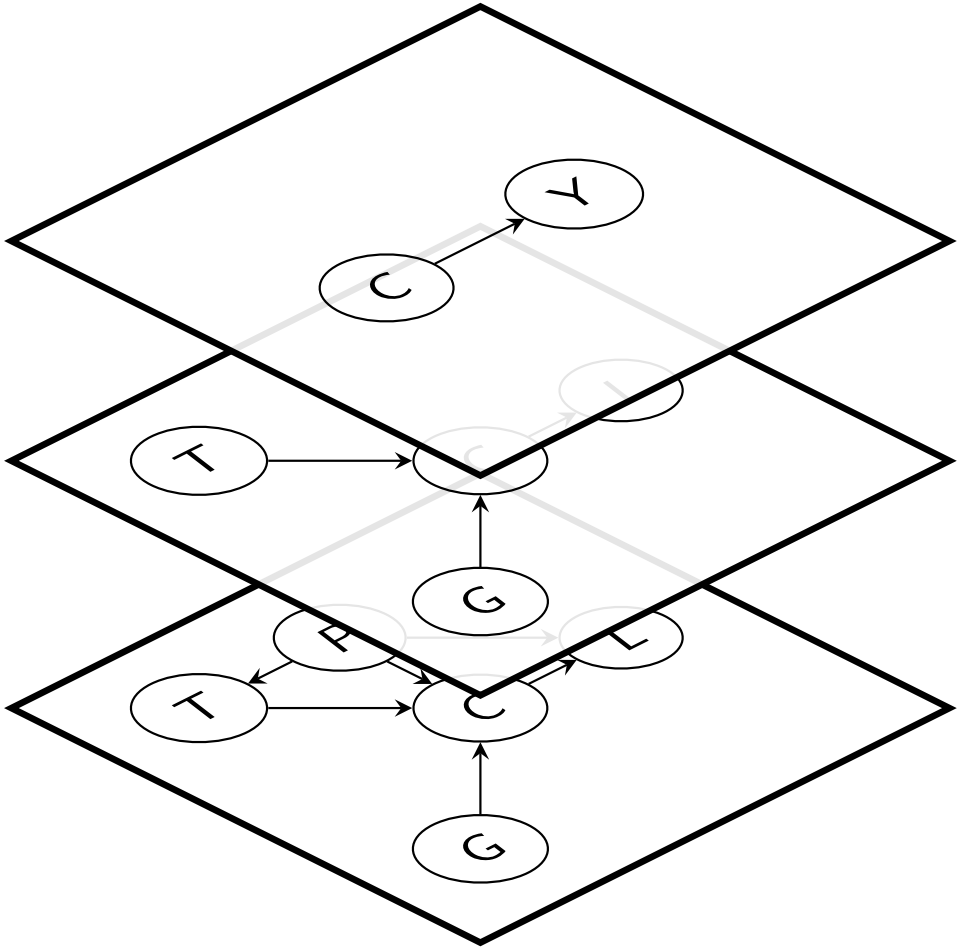
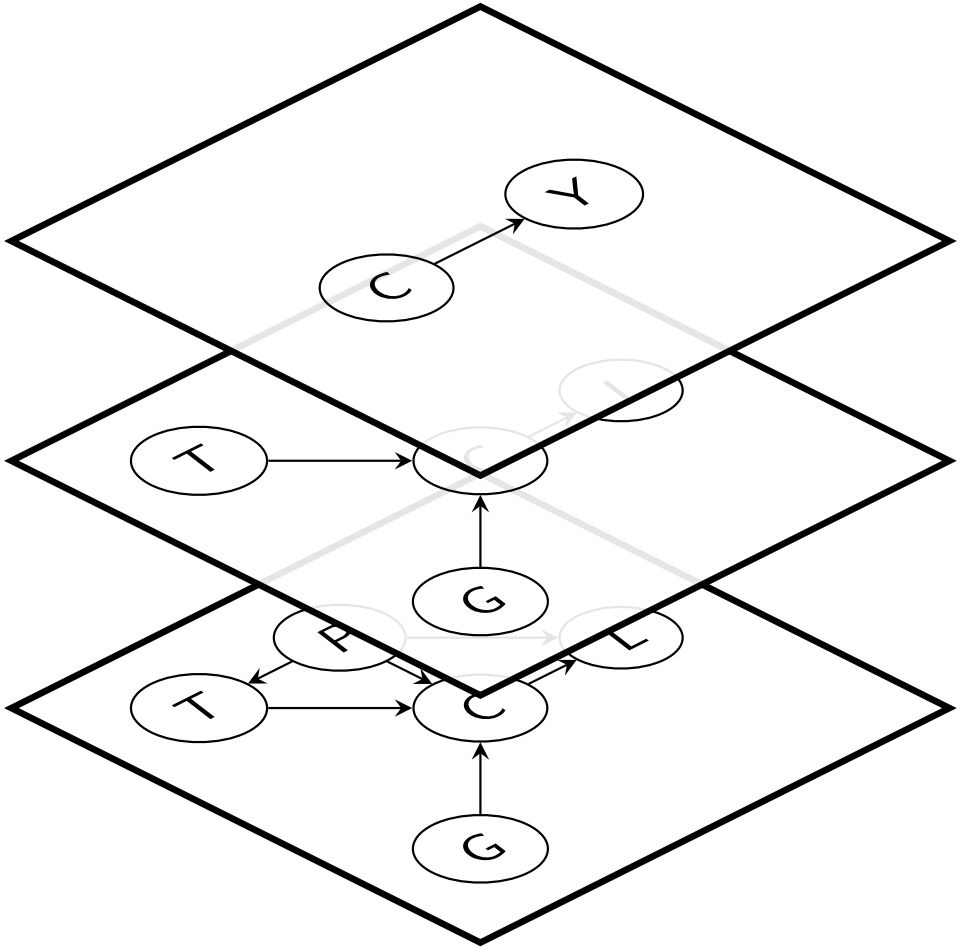


Lifetime 2yrs

Causal Abstraction

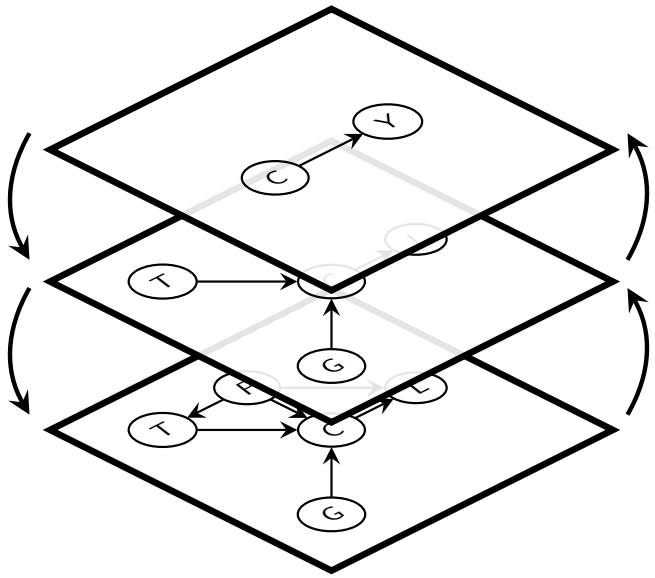


Lifetime 2yrs

Very good *abstracted/aggregated* results.

Causal Abstraction

How to relate *causal models* at ***different levels of abstraction***?



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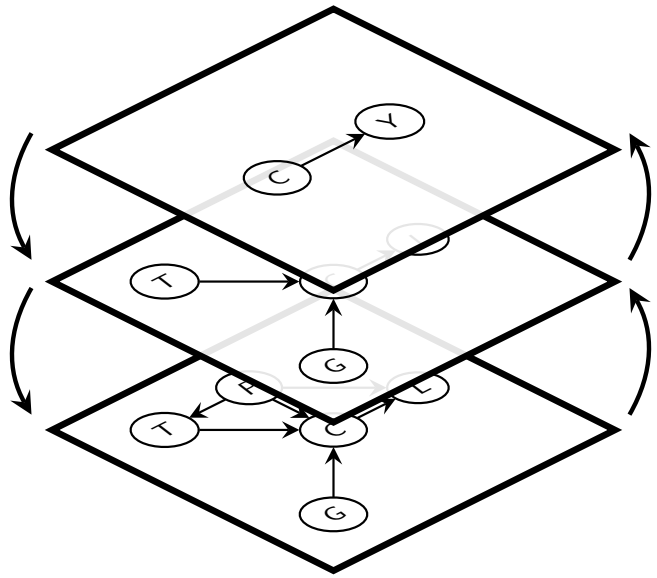

- Data integration;
- Statistical power;
- Computation on-demand;
- Consistent experimentation.

Thanks

Thank you for your attention!